Potash

James P. Searls, the recently retired potash commodity specialist for the U.S. Geological Survey, has compiled the following information on potash, a primary source of soluble potassium.

In 1807, Sir Humphrey Davy discovered a metal during the electrolysis of potassium hydroxide; he named the metal potassium because it came from potash recovered from wood ashes. The four types of potash are the water-soluble compounds potassium chloride, potassium sulfate, potassium-magnesium sulfate and potassium nitrate. The early uses of potash were in glass and soap manufacturing, as a diuretic, and another form was used in gunpowder.

Today, potash is typically used as an agricultural fertilizer. Potash, along with other primary plant nutrients such as fixed nitrogen and soluble phosphorus, is required for plant growth, as it provides potassium ions to plants.

Potassium, however, does not enter the plant structure as carbon, water and other elements do. Instead, the water-soluble potash compounds are found in the fruit of the plant and provide a source of potassium to fruit-eating animals, which, along with sodium, is required to control the water balance of the body in all animals. Potassium and sodium are also needed for electrical signals to travel along nerve paths for sensory information and for muscle contraction in the heart and lungs.

In addition to its use as a fertilizer, potash has important industrial applications. Potassium chloride is important where it is used in aluminum recycling, the production of potassium hydroxide, metal electroplating, oil-well drilling mud, steel heat-treating, sidewalk and street de-icing, and water softening. The glass industry uses potassium carbonate for television and computer monitor production. It is also used to produce alkaline batteries, animal feed supplements, some types of fire extinguishers, food products, pharmaceutical preparations and photographic chemicals, and as a catalyst in the manufacture of synthetic rubber. These nonfertilizer end-uses usually account for 10 percent to 15 percent of annual potash consumption in the United States.

In 2003, the United States produced about 2.4 million metric tons of potassium chloride, potassium sulfate and potassium-magnesium sulfate, and U.S. exports of these averaged 0.8 million metric tons. Imports of potassium chloride, potassium sulfate and potassium nitrate equaled 7.8 million metric tons. The United States had an apparent consumption of approximately 9.5 million metric tons of potash. World production was 51 million metric tons in 2003, with Belarus, Canada, Germany and Russia producing about 75 percent of the world’s estimated potassium chloride production.

Potash is mined primarily from evaporite deposits. Brazil, Canada, England, Germany, Spain, Ukraine and the United States produce potash from underground evaporites. In addition, potash is produced from brines occurring at Salar de Atacama in Chile, Qinghai Lake in China, the Dead Sea between Israel and Jordan, and the Great Salt Lake in Utah.

Originally published as *Geotimes* Mineral of the Month, February 2005
Used with permission.

Sample of potash with penny for scale. Image from *Minerals in Your World*.